American Electro-platers' Society

(An Educational Society)

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MONTHLY REVIEW

JULY, 1914

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JUL

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I shall pass through this world but once. Any good thing, therefore, that I can do, or any kindness that I can show to any human being, let me do it now. Let me neither defer nor neglect it, for I shall not pass this way again.—*Amiel.*

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MONTHLY REVIEW

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Vol. 1 JULY, 1914 No. 2

Editorial

Brass Tacks

There seems to be a distinct individuality in platers in regard to their opinions as to just how a plating solution should be made and how to operate it for successful results. Electro-plating is for one definite purpose, and platers obtain more or less successfully that end, and just why there should be such a variance of methods is difficult to comprehend. It must be that the "bump of imaginativeness" is strongly developed in those choosing plating as a vocation, and that along with the peculiar individualism creates in the mind the idea that the best and only method is the product of his fertile brain. The word "fertile" is right, for it seems that with each change of the moon, a new, and invariably a better formula is discovered.

Go through the books on electro-plating; through the files of trade journals and the publications of this society, and note if two formulas of the same exact construction can be found. Follow the articles of any of the writers in the journals and notice the changes in the "make-up" of the same kind of a solution. Let a plater who is ever so successful with certain methods and the use of certain chemicals forsake the tanks for the road and then mark how quickly other methods, other chemicals, have been found to be vastly superior; and, what is most incongruous, the newer ideas are often obtained after the finger is taken out of the solution and the actual work in the plating room relinquished. Look at the number of high speed nickel salt conglomerates offered that are to revolutionize the plating industry. Revolution is right, a sort of Mexican revolution, every one that can import or make a special brand starting a revolution of their own. All are *the* one that will multiply ad infinitum the deposit ratio of the old style solution and vie with the sun for brightness.

Naturally new things are always being produced and progressiveness is the watch-word of the day; but to be so there must be a definite purpose and that conscientiously followed. To keep changing, however, will never get one anywhere; neither will a plater be as successful as he can be until he clinches in his mind a dependable formula for each solution, and the component parts must be known and their addition understood.

It is about time the plater looked around and found "where

he is at" and got a distinct understanding of his work and of his tools. The reason there are so many concoctions on the market is that the plater has not found himself, and every opportunity needed is afforded to put one over on him. He knows certain things will not work, but cannot tell why. There is no one but himself to censure and no one but himself can apply the remedy.

This society has been so busy growing that no certain line of work that is to be of real value to its members has been laid out. One of the first things to be done is to study the solutions one by one and adopt a standard and use it. There is no better way to do that than by the process of elimination. Select a solution, let every member of the society send to the MONTHLY REVIEW his pet method, giving those little valuable sidelights on the operation that so often are the real secret of success. We will devote as many issues as necessary to the publication of the matter sent and then start the ball a-rolling, criticize, freely but justly. Ask questions and give frank answers, and don't care if you can't write good or express yourself freely, do your part even if you have to print your words. No one should be ashamed of his knowledge if he is earning an honest living from it.

A committee, one member from each Branch, should be appointed to carefully select the good points and construct two or more formulas from the data given. Publish these with the request that they be given a fair trial and the "kinks" concerning their behavior reported. From the facts thus obtained, a formula could be had that would stand the test and supplant all the rapid-fire processes.

If this society wants to be of real scientific value to its members and wishes to be truly educative, then it is time to do something and get down to brass tacks. H.

A Plea for Standards in Electro-Plating *

BY R. W. DAVENPORT
Detroit Branch

Electro-Plating is in a transition stage—it is becoming less an art and more a science. But it must still be considered an art in the sense that most of the knowledge concerning it is empirical or "practical," which means that but little is known as to the *WHY* of things.

So long as the Electro-Plater was *treated* as an *artist* this state of things was desirable perhaps; but nowadays the plater receives little or no consideration on that basis. If results are not satisfactory today, he cannot take a day off and get fresh inspiration—the manner common to artists, painters, sculptors, etc. Far from it. If results are not satisfactory today, they've got to be tomorrow. The plater must get his work out on schedule. He must produce.

It is absolutely essential in the Electro-Plating establishment of today—more particularly perhaps in the Plating Department

of a large Organization—that systematic production on a plane of equal efficiency with the rest of the scientifically managed plant be maintained. When such efficiency is not maintained, the *Plater* suffers, Electro-Plating suffers, the plating trade suffers and the employer himself suffers most of all.

The first step in scientific production is to *standardize* methods. This fact has been recognized by most industries and we find the technical and engineering societies generally devoting a great deal of energy and thought toward collecting and arranging in an orderly manner, all data relating to materials and processes. For example, the Standards Committees of the electrical engineering societies have formed a world-wide commission to this end and there is a specialized Society for Testing materials, which has done valuable work in its field.

It is evident that the American Electro-Platers' Society must lose no time in attacking this problem.

Our weakest point at present, is undoubtedly our complete confusion as to solutions. We add this or that and get perfect results; our neighbor adds the same thing and ruins his work. We come across a formula, try it, fail, and upon consulting a chemist, we find we have been mixing substances which are directly antagonistic to each other. But someone must have gotten good results or the formula would not have become public.

It seems to me that the first thing to do toward standardization, is to work out standard *specifications* for, say—a Nickel solution. This does not mean necessarily, a standard formula—that is beyond our means as yet. But we can specify *results*. The following form is suggested, tentatively, as a beginning:

"A E S SPECIFICATIONS—No. — 'NICKEL'

(1) Kind of work plated.....
(2) Average size each piece (area sq. in).....
(3) Total cathode surface.....
(4) Total amperes.....
(5) Total amperes (per sq. ft.).....
(6) Voltage across electrodes, Start.....Finish.....
(7) Total times of run.....
(8) Coulombs (or ampere hours).....
(9) Nickel from Anode.....ounces (or grams).....
(10) Nickel on Cathode.....ounces (or grams).....
(11) Nickel from Electrolyte....ounces (or grams).....
(12) Efficiency.....per cent

These specifications cover the deposition of nickel from other than cyanide-bearing electrolytes and shall be standard for the class of work named.

The work shall be cleaned in accordance with specification number — and shall not exceed the total surface specified.

The anodes shall be of cast) nickel, in accordance with specirolled)

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fications number — and must present a total superficial area — per cent greater than the cathode surface.

The runs shall be conducted in accordance with the Manufacturer's instructions, provided such instructions do not conflict with these specifications. The preferred temperature of electrolytes, preferred specific gravity of electrolytes and preferred—may be specified by the manufacturer of the materials used.

The efficiency of the run shall not vary more than — per cent under specified conditions."

It will be understood that this is merely suggestive of the form of a useful specification and will have to be enlarged upon and modified. But if a Plater follows rigidly some such form and if the Manufacturer has prepared his materials for the sole purpose of making them produce the results specified, wonderful progress will follow.

Permit me to suggest therefore, that a Standards Committee be here formed, whose duty it shall be to establish one or more standard specifications each month, such specifications to be made accessible to all Members and that the Committee—which should include Associates, shall handle any dispute, disagreement or misunderstanding between the user of a Standard article and the maker of it.

Besides the standardizing of results and in fact, before this is practicable, the electrical equipment of the plating room should be specified and standard apparatus and circuits should be adopted. The following form is suggested:

"A E S SPECIFICATIONS—No. — ELECTRICAL EQUIPMENT

These specifications cover the installation of electrical equipment necessary for a plant of.....gallons of.....solution, having a normal output of.....ounces of.....per hour.

GENERATOR

The Generator shall deliver.....amperes at.....volts at full load and shall be capable of sustaining an overload of..... per cent for.....minutes, with a temperature rise of less than .....degrees F.

The Generator shall (preferably) be of the flat-compounded-field type, and the voltage shall not vary more than.....per cent between full load and no load.

MAIN BUS-BARS

Shall carry the full load with a voltage drop of less than .....per cent from Generator to Switchboard.

SWITCHBOARD

The Switchboard shall be provided with a single pole overload release circuit breaker and main double pole switch of ample capacity.

The Switchboard shall be provided with an ammeter in the main buslead and such additional ammeters as shall be required for each branch circuit—if more than one is used.

A voltmeter shall be provided (of suitable range) and connected through a voltmeter switch to the electrodes of each tank in the entire Plant.

Field rheostats shall be included in the Generator circuits, on short, compound and separately excited generators.

CIRCUITS

If the Plant consists of more than.....tanks, each group of..... tanks shall be fed through separate leads and shall be equipped on the switchboard, with double pole switch and ammeter on each circuit.

The voltage drop from switchboard to tank shall be less than .....per cent on any circuit, at full load.

Each tank shall be equipped with a rheostat providing..... per cent variation at full load. The tank bus-bars shall show a voltage drop of less than.....per cent from end to end at full load."

The importance of standard equipment adequate to intelligent operation, can only be realized when it is remembered that not a single step toward getting uniform results can be taken until the plater is in a position to know how many ampere hours and what voltage each of his tanks is carrying. You may as well expect to run an electric light Plant without instruments, as to run a Plating room—and the employer must be made to realize this.

As I said before, the specifications given here are merely outlines; but it is hoped that from them you will see that it is possible to begin standardization at once, and once begun, the task grows easier.

Nothing you could do as a Society would so strongly re-act in your favor as this work. It will raise you in the eyes of your employer; it will knit you closer together individually; it will increase your value to Electro-Platers and strengthen your membership and it will go far toward creating for the American Electro-Platers' Society a place among the learned societies, where it rightfully belongs.

*Read at National Convention A. E. S., June 4, 1914.

Knowledge

By Frank B. Davis *

Wherever you see the heading American Electroplaters' Society you see immediately under it the words "An Educational Society." The principle behind the formation of the A. E. S. was the dissemination of knowledge and the principal reason that the A. E. S. has endured and grown strong is because it has constantly kept that principle paramount. We hold that any knowledge that may benefit the plater is desirable even though it be the so-called trade secrets or knowledge that may effect his well being. So I have taken knowledge as the subject of my remarks to you, its desirability, and suggestions of ways to obtain it.

Many platers are graduates from the University of "H. K.",

that famous institution of such tremendous roll that is popularly supposed to charge no entrance or attendance fees, but which in reality, exacts such a pitiless toll of one's life blood.

During my term and my "P. G." course I picked up a few maxims and I have accumulated, wherever opportunity offered, precepts that to me seem to be fundamentals.

They have stimulated me and it is with the hope that they may, by chance, be of use to others that prompts this effort.

It has been written that a man who will study one thing, however insignificant. until he knows more about it than any one else has solved his future.

Please keep this thought in mind as I proceed:

No man ever got very far—and stayed there—who did not spend a vast amount of brain-sweat, who did not think things out for himself, who did not try to map out his own course, to steer his own ship, who cannot bear disappointment and say if necessary, "My head is bloody but unbowed."

It is well said that knowledge is power but truth is knowledge and this brings me to Thomas Huxley and his famous dream, the influence of which abided with him to the end. He had a dream, and in the dream he saw himself dedicated to Truth.

A stern yet kindly voice said to him, "Thomas Huxley, you are to maintain your intellectual honesty and self-respect; and no matter what comes, you are never to lend yourself to the cause that does not seem to you to be backed by the evidence of facts."

To the voice he answered: "While I live my motto shall be, truth for truth's own sake. I will regard the value of authority as being neither greater nor less than what it can prove itself to be worth. I will smite all humbugs, however big. I will tolerate everything but lying." And he kept his word.

If there is any man who needs to know the truth it is a plater, the successful accomplishment of all his work depends upon truth and knowledge of all that enters into the make-up of his solutions.

There are men who claim that "bull" is as good as brains and that nerve is worth more than knowledge.

A man without nerve in a crisis is useless, but played as a continuous performance nerve loses its charm.

It is to be admitted that nerve has won many a jackpot but there is no strain on the mind of the man who holds four aces.

Circumstances call us all occasionally and knowledge is four aces in the game of life.

Specialize on some one thing that you take the most interest in and study it from every angle, know more about it than any one else. It may be black nickel, or corrosion bronze colors. Whatever it may be, never forget it. Become a crank on the subject—a crank by the way is usually a man with original ideas. He is apt to know more of the subject he is nutty on than any one else. Others may nickname him according to his specialty but they will hunt him cheerfully when they need information.

Knowledge is education and it makes no particular difference where you get it, once you obtain it you are educated.

There is only one thing equal to knowing what you want and that is knowing how to get it.

A man with a college education and but a superficial knowledge of plating is a poor plater compared with a man of common school education and a deep and abiding love for the vocation he has selected for his life work.

How many platers know how nickel salts and similar chemicals are made? I don't mean what they are made of or the proportions of what they contain, but *how* they are made. One may say that such things are not at all necessary but I maintain that a plater sufficiently interested in his calling to know these side lights is a better plater in consequence.

It is only the cheapest kind of a cheap fellow that will attempt to take credit for work accomplished by another, so never appropriate another man's idea without giving it twenty-four hours consideration. If nothing better occurs to you it is probable that Heaven meant to compensate you for lack of originality by giving you the ability to recognize a good thing when you see it.

Never speak of being down and out except in the past tense; that is, when you are up again and remember that no one can come back who has never been anywhere; and *never* forget that on all God's green earth there is not one first-class substitute for knowledge.

Cultivate an understanding of and an appreciation for, and a fair valuation of quality. It will give you stability and a sense of proportion as nothing else will, and refine your saving grace of common sense.

Don't be afraid to say that you don't know occasionally.

It is probably the truth, and it will create respect for your positive statements.

The wise guy who is always there with the ready answer is often measured up more promptly and accurately than he thinks, for the opinions of a man who has a positive notion on every subject mentioned are of no value, and there are those cold, cynical bosses who have learned that though calves may come and cows may go, bull goes on forever, and that an extra allotment of brains is rarely the cause of a swelled head, paradoxical as it may sound.

These I have found to be good formulas, but like all platers' formulas, if they are to be useful, each must adapt them to his peculiar requirements, for in all walks of life everything is up to "the man behind."

I will close with a few quotations on the subject, applicable to platers' lives and work.

"Knowledge is power."—Bacon.

"The first step to knowledge is to know that we are ignorant."—Cecil.

"The most difficult thing in life is to know yourself."—Thales.

"Man know thyself! All wisdom centers there."—Young.

"Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it."—Johnson.

"We know what we are, but know not what we may be."—Shakespeare.

"What can we reason, but from what we know?"—Pope.

"We know things, and we know that we know them,
How we know them is mystery indeed."

—Mivart.

"When want of learning kept the layman low,
And none but priests were authorized to know."

—Dryden.

"Not to know me argues yourself unknown."—Milton.

*Member New York Branch.

The Next Day After the Day After

By E. S. Thompson

The day was long and dreary,
Blue Monday was its name,
And the yarn I'm going to spin you
Is of a plater known to fame.

He was working Cyanide Copper;
Nickel, too; and bronze and brass—
Rotary devices must be mentioned—
That shop surely was some class.

But somehow things were out of kilter,
The copper was dead and the iron showed through.
The brass was red and getting redder
And the bronze was red and white and blue.

The nickel sure looked awful sickly,
It was hard and blue and thin;
And the way the air smoked around the buffer,
Caused the plater to feel like sin.

The rotaries were loaded fully;
The "stat" was set exactly right;
The time was just the same as ever;
But somehow the "plate" had taken flight.

The plater opened up his desk-top,
And among the papers there galore,
He looked for just one ray of sidelight,
That would smooth his troubles o'er.

Schneider wrote him, "Trisalyte,"
While Liscomb mentioned, "Capstone Salt."
Proctor said, "Use Bisulphite,"
And Schulte said, "Too much malt."

First Trisalyte went in the copper,
While the brass got a dose of bisulphite;
The nickel was doped with Liscomb's Capstone—
The bronze was left out of the fight.

The scrubbers hollered, "Boil it";
The tank man yelled, "Cyanide";
The buffer said, "Put in a conductor,"
All around was friendship bonafide.

The plater followed all the suggestions;
But the solutions still continued to shirk.
Then he sat him down for a good hard study,
Of how to produce the work.

How long he would have sat there thinking (?)
Is hard for anyone to know,
For someone stopped the trouble by yelling:
"The belt is off of your dynamo."

Visiting a Modern Plating Plant

By J. Birnbaum

Considerable progress has been made in the Electro Plating of Metals in the past 15 years. Many of the old Guard of Electro-Platers see their predictions come to naught, they are forced to adopt the time, cost and labor saving methods of modern Electro-Plating if they want to stay in the ranks of efficient and progressive platers.

To prove or show how the Plating Room has changed, I wish to cite an incident, which perhaps did not only happen to myself, but also to other platers of the younger generation.

"When I entered my apprenticeship in the art of Electro Plating of Metals, the foreman-plater, the very first day stuck his finger into the top button hole of my jacket, and gently led me through his department (you know how gently they do it), and said this: "Now, Kid, don't get discouraged when you get black and dirty from that Buff or Polishing Wheel, don't throw up the sponge when the potash or Vienna lime softens your fingers. Stick to it, Kid. Remember you are learning a trade which positively cannot be replaced by machinery, not one part of it; it's hand labor in our trade, and no machine will ever take your job."

Now, here was a Plater who has worked at Electro Depositing of Metals by means of a permanent current of Electricity obtained from steel magnets ever since that great invention was in its infancy. He has seen the magnetic machine, called the dynamo, take the place of the troublesome battery. He has seen new solutions, new finishes, improved dynamos, improved polishing equipment, etc. He was an expert and proficient plater, and has taken an active part towards improving the Electro Depositing of Metals,

but little did he dream of the economic and efficient plating and polishing room of today.

From ancient times up to the invention of steam power, all polishing of iron, steel, and non-ferrous metals, was in some way or manner done by hand. The cutting and brightening materials used then, were practically the same as are used now, such as ferrous and alkaline earth, oils, ground glass, and later emery.

For buffing and coloring we have been using them for many years in compound form, or the emery glued on felt, leather, or canvas wheels.

Necessity makes invention, especially in these days of unscrupulous competition, where the labor and overhead cost is figured to almost a fraction of one cent, and so through the evolution from hand polishing to foot power machines, thence to the steam power and electric driven polishing laths, we have today the "Man Replacing Automatic Polishing Machine."

Surely almost every one of you has had occasion to see one kind or another of these Automatic machines, be they grinding, polishing, buffing or coloring machines at work, or is perhaps working one.

Time and space forbid going into a detailed description of these Automatic Polishing Devices, and therefore I will just roughly sketch one, to show that they are certainly a great aid to the Polishing Department, but by all means no cure. You would not try to remove an aching corn with a headache powder or a headache with a corn plaster. Of course not. Well we have practically the same extremes in the Automatic Polishing Machine.

You can't buff or color automobile lamp parts, rims, hubs, etc., with a machine which is especially constructed to polish stove plate and covers, or polish stove plate and covers with a machine which is constructed to buff automobile lamp parts, rims, etc. Although there are machines on the market that will handle various kinds of articles, most automatic polishing machines are so constructed as to finish certain lines of work. Foundries, Stove, Bedstead, Tub and Sheet Manufacturers and numerous others are using such machines at the present time, and their results are excellent, considering that one man operating one or two of such automatics is in some instances able to turn out as much work as five to eight experienced polishers do by the polishing lathe method. This is a conservative estimate. Of course all work cannot be done automatically, but here is a large field open for the polisher with an inventive mind, and the near future will no doubt bring some astonishing improvements.

THE TUMBLING

The tumbling barrel is the oldest automatic mechanical polishing device known to the electro-plater. It is also very extensively used in foundries to remove the sand from small castings for their purpose. Some castings are mixed with so-called stars. For smaller or flat castings this is usually not necessary.

To mix steel stampings with tumbling stars would be a useless waste of barrel space. Steel stampings always have a sharp cutting edge, and thus grind and polish themselves very freely. However, it is a good practice to mix large and smaller stampings, more so with stampings that have a tendency to pack or nest. By all means do not mix more than two kinds, as by mixing of more, you will lose time later on by sorting them, either at the lacquering or packing operation.

The speed of a tumbling barrel ought to be between 30 and 45 revolutions per minute. A slower speed will consume more time, whereas by a much higher speed the centrifugal power would be too great, and consequently the load will not roll as freely. By filling the barrel about three-fourths you won't run any chances of damaging the goods to be tumbled. Egg or oval-shaped barrels will turn out a charge better and in less time than a cylinder-shaped barrel, because an egg or oval shaped tumbler rolls the work not only around, but also from and to center, thus increasing the tumbling facility.

We have designed and are operating at present some rattlers with the following dimensions: Length, 7 feet; center diameter, 5 feet; end, 3 feet. A rattler of these dimensions has a capacity of about 10 bbls. and its running time for pickled, hot rolled steel, is approximately 18 hours.

The materials generally used to polish the work in dry tumbling are sawdust, leather meal, silica and scrap leather. For wet tumbling water and sal soda.

A newcomer in the line of tumbling is the Burnishing Barrel. By means of highly polished steel balls, this is a wet process and is used before as well as after plating. As far as brilliancy of finish is concerned, no other method of tumbling can come within hailing distance of burnishing with steel balls.

The burnishing barrel really ought to be counted in the class of automatic buffing and coloring machines, because lots of small articles which before its introduction had to be colored on the polishing lathe are now finished with this process, and the alert manufacturer who has these thousands and thousands of little burnishers do his coloring is sticking a good many bright eagles into his pockets which otherwise would be expended for labor cost.

The running expense is very low. The material cost for one charge ought not to exceed 2 cents, as the burnishing solution consists of but water, with a small amount of either a special prepared burnishing compound, Fig Soap, or Peruvian Soap Bark.

A FEW DON'TS ON BURNISHING

Don't attempt to burnish sandy or scaly stock; you would have poor results, and ruin the burnishing balls.

Don't fill the barrel with grease and oil covered articles and then follow it up with a plated load. Better remove oil and grease first, as some of it is bound to adhere to the lining of the barrel,

but little did he dream of the economic and efficient plating and polishing room of today.

From ancient times up to the invention of steam power, all polishing of iron, steel, and non-ferrous metals, was in some way or manner done by hand. The cutting and brightening materials used then, were practically the same as are used now, such as ferrous and alkaline earth, oils, ground glass, and later emery.

For buffing and coloring we have been using them for many years in compound form, or the emery glued on felt, leather, or canvas wheels.

Necessity makes invention, especially in these days of unscrupulous competition, where the labor and overhead cost is figured to almost a fraction of one cent, and so through the evolution from hand polishing to foot power machines, thence to the steam power and electric driven polishing laths, we have today the "Man Replacing Automatic Polishing Machine."

Surely almost every one of you has had occasion to see one kind or another of these Automatic machines, be they grinding, polishing, buffing or coloring machines at work, or is perhaps working one.

Time and space forbid going into a detailed description of these Automatic Polishing Devices, and therefore I will just roughly sketch one, to show that they are certainly a great aid to the Polishing Department, but by all means no cure. You would not try to remove an aching corn with a headache powder or a headache with a corn plaster. Of course not. Well we have practically the same extremes in the Automatic Polishing Machine.

You can't buff or color automobile lamp parts, rims, hubs, etc., with a machine which is especially constructed to polish stove plate and covers, or polish stove plate and covers with a machine which is constructed to buff automobile lamp parts, rims, etc. Although there are machines on the market that will handle various kinds of articles, most automatic polishing machines are so constructed as to finish certain lines of work. Foundries, Stove, Bedstead, Tub and Sheet Manufacturers and numerous others are using such machines at the present time, and their results are excellent, considering that one man operating one or two of such automatics is in some instances able to turn out as much work as five to eight experienced polishers do by the polishing lathe method. This is a conservative estimate. Of course all work cannot be done automatically, but here is a large field open for the polisher with an inventive mind, and the near future will no doubt bring some astonishing improvements.

THE TUMBLING

The tumbling barrel is the oldest automatic mechanical polishing device known to the electro-plater. It is also very extensively used in foundries to remove the sand from small castings for their purpose. Some castings are mixed with so-called stars. For smaller or flat castings this is usually not necessary.

To mix steel stampings with tumbling stars would be a useless waste of barrel space. Steel stampings always have a sharp cutting edge, and thus grind and polish themselves very freely. However, it is a good practice to mix large and smaller stampings, more so with stampings that have a tendency to pack or nest. By all means do not mix more than two kinds, as by mixing of more, you will lose time later on by sorting them, either at the lacquering or packing operation.

The speed of a tumbling barrel ought to be between 30 and 45 revolutions per minute. A slower speed will consume more time, whereas by a much higher speed the centrifugal power would be too great, and consequently the load will not roll as freely. By filling the barrel about three-fourths you won't run any chances of damaging the goods to be tumbled. Egg or oval-shaped barrels will turn out a charge better and in less time than a cylinder-shaped barrel, because an egg or oval shaped tumbler rolls the work not only around, but also from and to center, thus increasing the tumbling facility.

We have designed and are operating at present some rattlers with the following dimensions: Length, 7 feet; center diameter, 5 feet; end, 3 feet. A rattler of these dimensions has a capacity of about 10 bbls. and its running time for pickled, hot rolled steel, is approximately 18 hours.

The materials generally used to polish the work in dry tumbling are sawdust, leather meal, silica and scrap leather. For wet tumbling water and sal soda.

A newcomer in the line of tumbling is the Burnishing Barrel. By means of highly polished steel balls, this is a wet process and is used before as well as after plating. As far as brilliancy of finish is concerned, no other method of tumbling can come within hailing distance of burnishing with steel balls.

The burnishing barrel really ought to be counted in the class of automatic buffing and coloring machines, because lots of small articles which before its introduction had to be colored on the polishing lathe are now finished with this process, and the alert manufacturer who has these thousands and thousands of little burnishers do his coloring is sticking a good many bright eagles into his pockets which otherwise would be expended for labor cost.

The running expense is very low. The material cost for one charge ought not to exceed 2 cents, as the burnishing solution consists of but water, with a small amount of either a special prepared burnishing compound, Fig Soap, or Peruvian Soap Bark.

A FEW DON'TS ON BURNISHING

Don't attempt to burnish sandy or scaly stock; you would have poor results, and ruin the burnishing balls.

Don't fill the barrel with grease and oil covered articles and then follow it up with a plated load. Better remove oil and grease first, as some of it is bound to adhere to the lining of the barrel,

also to the balls, and will thus impare the brilliancy of the plated articles.

Don't let the burnishing balls get rusty, if you happen not to use them for several days. Rust most naturally will spoil their highly polished surface, and to repolish the balls means a loss of time. A good way to prevent rust is to dry the balls in a drying apparatus or drying barrel if you have one in your plating equipment, if not, it will do to keep them submerged in a dilute cyanide solution.

Don't have a larger measure of work than you have burnishing balls. To receive the best results use about one peck of work to one peck of balls. If the work does not turn out as bright as it ought to be, then you either are using not enough balls, or not enough burnishing compound.

Another improvement over the old style tumbling barrel is the tilting barrel. This barrel is of great help to the plater who has real small articles to finish, such as rivets, screws, nails, etc. It has several advantages over the horizontal barrel, inasmuch as it can be run at any angle, the work is visible at all times, and it can be used for wet as well as dry tumbling.

In my estimation I have covered the tumbling process about as thorough as can be done in a concentrated form, and this reason our next step will be to the mechanical improvements in the plating room proper.

MECHANICAL IMPROVEMENTS IN THE PLATING ROOM

What has been said about automatic polishing goes also for mechanical plating. All work cannot be done mechanically.

It would be folly to attempt to plate sharp, surgical instruments, tableware, such as plates, coffee pots, knives, etc., larger stove parts, or highly polished and buffed smaller articles by means of a mechanical plating barrel. Any such attempt would be a complete failure. Some work of this kind can be and is plated with the aid of special constructed continuous machines, but as a general rule, the still solution is the best and most reliable way of plating such articles. A line can easily be drawn between what can, and what cannot be plated in the mechanical plating barrel.

All articles which pass through the tumbling or burnishing barrel process can be successfully plated in the rotary mechanical plater, also all small articles on which not the smoothest finish possible to obtain is demanded. All articles that can be plated in the mechanical plater will receive a more durable, more sightly, more uniform, and more brilliant deposit than they do if they are plated in the ordinary still solution.

The human plater cannot do two plating operations at once, the mechanical plater does. The mechanical plater deposits and burnishes the metal in one and the same operation, and so excellent that lots of articles are, with the exception of drying, ready to either lacquer or pack without any further operations.

All makes of the revolving plating barrel as we have them

today are the final triumph over what seemed years ago insurmountable obstacles, but here and there arose a determined plater who insisted upon solving the problem of mechanical plating, and so we have finally passed from failure to success.

There is no doubt but that the introduction of improved plating dynamos has been of great assistance towards successful barrel plating.

The electro plater who has seen some of the first attempts of mechanical plating does readily understand the significant developments of the revolving plating barrel.

I saw one of these crude instruments in action at Zurich, Switzerland, and it certainly was anything else but a pleasure to run it, as one plater remarked: "Nix on that noise. I'm not going to work at so and so's, why they want a fellow to tumble and plate the small trash they got there at once, that crazy outfit don't work. As fast as you put the plating on it rubs off again."

Later on I took a slap at Barrel Plating myself, made a failure, denounced it, tried it several years later again, and now I can heartily recommend it.

Mechanical plating is after all not so very difficult. There are of course several points to follow, which must not be overlooked. They are:

1. The proper equipment.
2. A higher density of the plating solution.
3. A higher conductivity of the plating solution.
4. A higher voltage.
5. To mix such work as nests very easily—the same as I mentioned under tumbling—and there won't be any trouble from this source.
6. It's a very poor policy to attempt to rush and hurry a larger quantity of work through by overloading the barrel.

To fill the barrel about one-half is just the right amount, at any rate not much more than half.

The mechanical plating barrel can be operated between two and sixteen revolutions per minute. This depends a good deal on what kind of solution and goods are running. The proper speed for brass is about twelve. For copper and nickel a lower speed can be maintained.

The thickness and consequently the durability of the deposit depends upon the density of the solution, the amount of current used and the length of time in which the articles to be plated are immersed in the bath.

Where one plater claims to turn out goods that will allow coloring in 20 or 30 minutes, another plater might not be able to do so, even working under the same voltage. He would then do well to find out if the first mentioned plater is not running a smaller load than he is.

Wherever a heavy solid deposit, one that will stand coloring safely is demanded, it is advisable not to run the work for a lesser

period than 45 minutes or even extend it to 60 minutes. If, however, you should want an extra, out of the ordinary heavy coat, and would like to carry the plating away beyond the period of time given above, let's say two hours, you can do so without running any risk of peeling the deposit, which, of course, could not be done in the ordinary still solution. The plain and simple explanation for this is, the deposit is continually being burnished during the plating operations.

As a time, cost and labor saver, the mechanical plating barrel as well as the continuous machines run a neck and neck race with the automatic polishing devices. The amount saved, depends of course, on the size of the apparatus and the size of the pieces to be plated. The average dimension of the revolving barrel of the mechanical plates are the following: Length, 36 in.; diameter, 18 in., however, smaller and also larger barrels are used to advantage. At present we are running among other sizes a barrel 72 inches long by 25 inches diameter. This machine is used for brass plating, and the capacity thereof is 2½ bushels per hour. This may give you an idea of the amount of small pieces that can be plated in one day by three men operating four such platers. As far as experiments have shown, it would be a risky undertaking to have the diameter of a revolving barrel go beyond 26 inches, I mean a barrel that is submerged in the solution three-fourths of its diameter, and still it can be done if the machine is so constructed as to have a positive pole on the in as well as the outside of the revolving barrel. The material used in the construction of the barrel is with the exception of the metal contacts, nonconductors, either perforated wood or a wooden frame with canvas leaves. The cost of renewals in a given space of time is for both about equal. By ten hours heavy work per day the canvas leaves last thirty days, and the mahogany leaves about seven months. At the expiration of that time they usually have to be replaced, but the cost of repairs is very low. Considerable more money would be spent for copper, wire and racks to plate the same quantity of work in the still solution. Improvements are of course, open in this direction and perhaps some day there will be a wire, reinforced, perforated glass barrel on the market. It certainly would outlast any wooden barrel for years, and also put a stop to wood pulp being ground into the solution, although so far I have not detected any detrimental effects in the plating bath caused by the wood wearing off. Along with the mechanical plater usually goes or is sold some sort of a lifting device, to facilitate an easy manipulation of the plating barrel, and it is very imperative to have one, but those that have been manufactured up till now, have not proven to my satisfaction, therefore I have designed, and am operating a handy lifter, which I will describe for the benefit of those who are operating Mechanical Platers, or contemplate installing one or more.

I stated above that the 36-inch barrel is the most popular, therefore I will take this size as a basis.

1. Get a galvanized iron tank 42 inches long, 20 inches wide, and 18 inches deep with an outlet at the bottom, make a frame out of 2 x 4's to bring the galvanized iron tank within 8 inches from the top of the plating tank, set a wooden box with a wire netting bottom into the iron tank, place it parallel with the revolving barrel, and fill with cold water. Attach a shaft, 2-inch diameter (at the same side where you place the water tank), so that the center of the shaft is 3½ inches from the top of the plating tank. Use a five foot shaft for a five foot long tank, but place the shaft so that 3 inches project on one side. On this shaft key two arms 24 inches long that curve down about 6 inches towards the center of the plating tank, attach these arms to the end supports of the barrel, so that it can be revolved freely. Keep a 12-inch diameter worm gear on the 3-inch projection of the shaft and under this gear fasten a 3½-inch worm with a 1-inch rod running along the end of the plating tank, projecting 6 inches on the other side, stick a 12-inch crank on the end of the rod, and the lifting device is ready to be used. By means of this lifter a boy can raise or lower several hundred pounds without exertion.

To empty the barrel turn the crank to the right, it will then raise out of the solution. It can be held suspended in the air at any degree without falling. It can also be revolved while suspended. By doing so, every drop of solution that comes in some of the work will fall back into the tank. After the solution is drained off, turn the barrel further until it hangs over the water tank, remove the cover and drop the work into the wire netting box. There the metal goods can be left until you are ready to either burnish, dry off or lacquer them.

By operating this lifter properly not more than two minutes ought to elapse from the moment the barrel is raised up to the time it is started with a new load.

Continuous plating machines are used for electro plating of nickel, copper, zinc and brass, but to a greater extent for zinc (Electro galvanizing).

A large book could be written in explaining the mechanism of the various constructed apparatuses. They are the same as the automatic polishing devices, mostly built for special kinds of work. Pipes, rods, sheets, band iron and all sorts of hardware are advantageously plated by means of such machines.

The plater or manufacturer who is interested in this line and thinks such an apparatus would be a valuable asset to him or his plating equipment, ought to take it up with firms that make a specialty of rebuilding them.

Other late improvements in the plating department which deserve mention are, The Electric Cleaner, The Centrifugal Drying Machines and Drying Barrel, and last but not least, the Spray or Atomizer.

THE ELECTRO CLEANER

To receive a good adhering deposit the articles to be plated must be free from all foreign substances, oils, fats, and tarnish. In other words they must be chemically clean. If not, the results are faulty, spotted and peeled goods. To accomplish this, the plater formerly used potash lye, lime, powdered pumice stone, and lots of elbow-grease, but now the electro cleaner has, wherever installed, done away with a whole lot of this tiring and troublesome job. It is an improvement over the old style potash tank and consists of a, for this purpose, prepared cleaning solution in connection with an electric current. The current connections are the same as for plating: Positive "Anode," Negative "Cathode." From 30 to 60 seconds are sufficient to turn out perfectly clean work.

Trouble has been and is yet experienced in getting some kinds of articles clean, but no doubt through further experiments this will be overcome shortly. The electric cleaner if properly manipulated furnishes not only cheaper, but also better and cleaner work, free of all lime, brush and pumice stone scratches.

DRYING APPARATUS

A large percentage of work is now dried with the aid of Centrifugal Dryers, tilting drying barrels, or in the individual shop, specially constructed drying machines. The word centrifugal speaks for itself, through a highly revolving motion, in combination with a hot air blast, a large bulk of work is dried within a very short time.

The drying barrel is a combination of a dryer and tumbler, wherein the articles can be dried and tumbled.

All these dryers may not be as important as some of the previously mentioned inventions, but they are by no means unimportant.

It might be well to remind you of the song of a few years ago "Every little bit added to what you got makes just a little bit more."

THE SPRAY OR ATOMIZER

A spraying outfit consists of an air compressor, a compressed air reservoir, the atomizer, and if possible a one suction pipe connected hood.

It has always been difficult to lay on a nice even coat of black of a heavy rich gold lacquer by means of the fitch or camelhair brush. The spray does this comparatively easy, and it don't take much of an expert lacquerer to operate it either. Yes, and it does the work not only better, but also a whole lot cheaper, with the exception of where you dip lacquer small pieces in bulk. And even there the atomizer can be used in combination with a slowly revolving tilting drying barrel. By spraying the lacquer on the rolling pieces they dry quick and won't show any lacquer drips as is usually the case in common bulk dip lacquering.

In an abbreviated way this is about all I can say of Mechanical

Improvements in a Modern Plating Department. I've said nothing about chemicals and plating solutions, but will gladly do so at a future date.

If this little visit has pleased you and was instructive in some parts, then I say thanks for having had the honor of conducting you through an up-to-date plating department.

*Read at A. E. S. Convention by O. E. Servis, June 5.

The Plating of Non-Conducting Surfaces * Glass, China, Flowers and Other Non-Conducting Substances

By E. G. Nordblom. †

I will begin with glass and china, as this branch has received more attention than any other. When I first saw this beautiful work it was performed in a different manner from that which is now used at the present time. The operation was what is known as the pouring process, which is as follows: First prepare a solution consisting of distilled water 4 oz., nitrate of silver (crystals) 90 grains. This is termed solution No. 1. Next make solution No. 2, by heating 25 oz. of distilled water to the boiling point and stirring in 2½ oz. Rochell Salts. To this add solution No. 1, let cool and allow precipitate to settle. Next make a separate solution of nitrate of silver 1 oz. and distilled water 8 oz.; then add aqua ammonia until precipitate formed is nearly all redissolved. Now add distilled water until the volume is 96 oz. This is solution No. 3. Mix equal parts of Nos. 2 and 3, and it is then ready for use.

When the glass to be silvered has been made chemically clean pour the above solution over it, taking care to cover every part. In a few minutes it will be covered with a thin sheet of metallic silver and will be ready for the bath. Great care, however, must be taken in handling the article, because the thin sheet of silver formed is very delicate and easily broken if touched by the hand. After the article has received a sufficiently heavy deposit it is rinsed and dried, then buffed and a suitable design traced upon it. After painting over the design with asphaltum dissolved in benzole or turpentine, the rest is etched away and it is ready to be engraved and polished for the market. The above process is an old one and is not now in use for that class of work, so I shall endeavor to explain the more modern method of plating on glass and china, or the so called silver deposit ware.

The results of this process will be found more sure and satisfactory. To start with, perfect glass must be selected. The decorators then paint on the design with a paint made in the following manner: Metallized silver 5½ parts, calcined borax 1 part, boric acid ½ part, soft glass powder ½ part, hard glass powder ½ part, red lead ½ part, nitre 1 part, mixed together and turpentine added to make a thin paste. The whole is then put into what is called a "Mueller" together with a lot of agates—or smooth flint stones will

answer the purpose. Then seal on the top and let roll in a belt driven device for twelve days or more. The more it is ground the finer the paint and the better it is for the purpose. After the paint has been sufficiently ground it is poured onto a large slab of glass or marble and separated from the agate or flint stones. It is then dried and put into jars until it is to be used.

To decorate a piece of work a small quantity of this dry paint is mixed with a little fat oil of turpentine and painted on the article. After drying from three to five hours it is ready for the firing which is one of the most important parts of the operation. The kiln used for this purpose is made similar to those used by china decorators. They are so built that shelves can be arranged to suit the work in hand, gas being used to heat same. After the kiln has been loaded, the heat is started with one row of gas jets until it is quite warm, when other jets are added until all are burning. The work must be carefully watched through a hole in the kiln provided for the purpose. The temperature is raised until nearly the melting point of glass has been reached. At this point great care must be taken as a little over heating will result in warping the glassware out of shape, and a little under heating will result in the deposit coming loose after being plated, so that experience is necessary to obtain good results every time.

After the work has been fired it must be allowed to cool slowly, as cold air striking the articles while they are hot will cause every piece to crack. To do this work commercially two or more kilns are used so that one may be loaded while the first is cooling off. The time taken for firing from start to finish is from four to six hours. After the work has cooled it is ready for the plating bath without further treatment as it has come from the kiln chemically clean, all foreign matter having been destroyed by the heat. It is now only necessary to connect wires in such a way that only the ends touch, so that no wire marks will be visible after the work is plated. The solution used should contain from 4 to 8 ounces of silver and from 2½ to 5 ounces of free cyanide per gallon. The cheaper grades of work are run from 6 to 8 hours, while the better grades are allowed to remain in the bath 24 to 36 hours. Storage batteries are used to furnish the current during the night and on Sundays when steam power is not available.

After the work has received a sufficiently heavy deposit it is sand and tripoli buffed, next engraved and then "colored" on the color buff, and is then ready for the market.

NOTE.—To make metallized silver fill a china bowl about two-thirds full of chloride of silver and cover with dilute sulphuric acid—1 part acid to 6 parts water—then take sheet zinc cut into strips about 1 by 5 inches, immerse these strips in the solution so that they are standing upright in the bowl about half an inch apart. Turning the chloride from time to time may be necessary in order to allow every part of it to come in contact with the zinc. It is then thor-

oughly washed twelve or fifteen times to eliminate all acid, dried over a gas stove and is then ready for the paint.

Having explained the process of plating glass, I will say a few words regarding the plating of wood, plaster of Paris, flowers, insects, etc.

I shall begin with the plating of wood. As a rule only hardwood is used and requires no further treatment than a coating of shellac. When thoroughly dry it is gone over again with a weak solution of shellac and a coating of ether. The best graphite or copper bronze powder—preferably the latter—is then applied. The best way to do this is with a soft haired brush about ½ to 2 inches wide or smaller for small work. When dry the work is ready for the plating bath after the loose powder has been thoroughly washed off. It should be carefully wired so as not to mar the surface, and it is preferable to dip it in a silver solution containing very little free cyanide. Then rinse in clean cold running water and immediately transfer to an acid copper bath when it will rapidly coat over with a deposit of copper. It requires careful watching for the first hour or two, and should any bare spots or other defects show where the powder did not take, it should be taken out of the solution, dried and a little shellac and bronze powder applied. After drying a few minutes it is again put in the plating solution. Care should be taken to dust off all loose powder or it will have a tendency to form air bubbles, in which case a rough deposit will result. After the deposit is sufficienly heavy the work is taken from the bath and polished. It can then be plated with gold or silver, or any other ornamentation applied.

Plaster of Paris and like materials should be first soaked in melted paraffine or bee's wax so that solutions will not penetrate the article and burst the deposit. The treatment is then continued as for wood.

In the plating of flowers and insects the methods have to be modified as these articles will not stand the heavy brushing as will the wood and plaster of Paris. There are several methods of treating these articles, such as the nitrate of silver dip which is reduced to the metallic state. I have, however, obtained equally as good results with bronze powder. Flowers and insects are treated about the same. These should be gotten as fresh as possible and before they have become dry and dilapidated should be immersed completely in a shellac solution and then swished back and forth to throw off all excess of shellac. They are then allowed to dry, which takes from thirty minutes to one hour. I then dip them in a second shellac solution made quite thin and before it becomes dry the bronze powder is applied by taking a quantity on a small soft haired brush and holding it close to the flower or insect it is given a hard blow of air from the mouth. The article then becomes coated evenly and smoothly with a thin layer of copper dust. It should then be reversed and the process repeated. By doing this

the powder will penetrate the deep portions of the article without crushing it.

In metallizing beetles or other insects it is advisable to first smother them with chloroform or illuminating gas. Next stick a pin through them to which a fine copper wire has been attached. They can then be treated the same as the flowers. Flowers after being plated are brought to a red heat to destroy all foreign matter, because if this is not done there is a liability of spotting out later on. They can then be bright dipped and plated with gold or silver or finished in any other desirable manner.

On account of such perfect results being obtained by the methods described above, I believe it unnecessary to go into details of the nitrate of silver dips as they are more or less complicated and the results in the end are no better.

*Read at the A. E. S. Convention, Chicago, June 5th, by W. S. Barrows.

†Foreman plater Standard Silver Co., Toronto, Can.

The Plater of Tomorrow *

By H. J. TerDoest.

Mr. President, Gentlemen and Fellow Members of the American Electro Platers' Society:

As we look back over the past five years, or since the birth of this society, anyone interested in Electroplating, yes, even those outside of this society, can easily see that a great interest in electroplating has been aroused by this society. The trade papers plainly show it. Never before have they discussed plating as now, and this society has only commenced to get at the platers' troubles.

Manufacturers are beginning to see the needs of the plater as never before, and are making goods to lessen his troubles; some with merit, and others for profit only, but it is needless to say that this society will soon weed out the latter.

The average plater of today has only been taught to clean his work in a certain way; hang it in the solution, regulate his current until it shows 2 or 3 volts, as the case may be, and leave it in about a certain time or until he can get around to it to take it out, as he is little concerned if he forgets it, and it runs twice as long as he intended; and if the corners are burned, he simply sands them off a little and lets the buffer take over his troubles. Right there he starts a fight between himself and the nickel buffer, for if he cannot buff it, the plater says he is no good, and the poor buffer cannot buff it for there is nothing to buff.

As I call to mind one place where I went to work, they put a large iron washer on the bottom of each wire, so the work would not burn. Just to think of all the work wiring and unwiring the washer each time with about six pieces of work on with it, and the waste of nickel on that washer about 15% of the total work, and when the work still burned they put enough boracic acid in the

solution and to burn the work or plate it either for that matter as it could not be nickel buffed without cutting through.

Silver work done by the average plater has to be burnt or he is of the opinion there is no silver on it. I think many of us can recall the time when we thought that.

As for brass, it is generally any color you can think of except a brass color.

Every chemical that the plater can think of, has, at different times been put in that brass solution to make it plate faster, brighter or a more uniform color, or to make it plate at all sometimes. But I think this society will soon have established standards for the various kinds of work that a plater can follow, and be sure of his results. He will be able to analyze his solutions every week, and put a certain definite amount of chemicals in his solutions, and will have a plating alarm in connection with an ammeter or an amp. hour meter to automatically stop his current when his predetermined amount of metal has been deposited and every piece of work will be exactly like the other and the work will be done for a great deal less money than now, and will be better work. He will, by studying resistances, be able to plate his work heaviest at any point desired, instead of just at the extremities as now.

He will be able to appreciate a good many things that science has put on the market for his use, such as Compound Dynamos, Plating Alarms, Amperehour Meters, Parallel Rheostats, that allow you to put 100 or 200 Amperes through your solution in one Ampere step, so that he will be able to plate his work with the utmost speed, as his solutions will always be the same and the same number of Amperes will always plate the same work the same way, and consequently he will do his work something like this; a certain number of pieces in a tank run at a certain number of Amperes, a certain number of minutes, and he will always get the same results.

He will also know when he puts arsenic in his brass solution if it is really brightening the deposit and at the same time depositing at the same rate as before he put the arsenic in, or if it is because the arsenic made the Oxygen Anions more active and oxydized the anode which in turn put more resistance in the circuit and lowered the rate of deposit and in that way keeps it bright. He will further be able to make an analysis of his chemicals and will order his supplies something like this: 1 bbl. Sulphate of Nickel, to contain no less than 21% of Nickel. 1 case Cyanide, 98-99% both in accordance with the standard analysis of the American Electroplaters' Society. What is more, he will know that if he buys Double Salts at 8c, and Single Salts at 12c and nickel anodes at the same time cost 49c a lb. that the nickel does not cost more from the Salts than from the Anode as the Single Salts contains 21% nickel and cost 12c. It will take 100 divided by 21 which equals 4.76 lbs. of

Single Salts to contain 1 lb. of Nickel and 4.76x12c—$57.12 a lb. for Nickel in solution ready to go on the work. Now, that is not quite 17% more than it costs in the anode, but we have to take into account the chemicals it takes to put it in solution on an equal footing with the metal in the Salts. Also the loss between anode and solution and the scrap anodes that never get in solution and furthermore, what is about as important as anything, I have mentioned both from employer and employee's point of view, is that he will have a pressure regulator or a Thermostat in his potash steam line, so that when he has wrestled with the problems of his silver, nickel and brass solutions all day, he will not go home and disturb the peace of mind of his good wife by letting out an unearthly yell Potash,, as he dreams that that is boiling over for the 10th time that day, and I dare say, in this connection, there is more Potash wasted than used in a great many plating rooms.

Now, Gentlemen and Fellow Members, I think this Society will not only do this, but a great deal more, but as I cannot take up too much of your valuable time, I will thank you all for your attention and hope we may be of mutual benefit to one another.

*Read before the Second Annual Convention, Chicago, Illinois, June 5, 1914.

Making a Paper More Valuable

As I was only a visitor to the convention I found it quite difficult at times to keep my seat during some of the discussions of the Convention proper, and it brought to my mind the fact, that when a paper is published in our MONTH'Y REVIEW it is only one man's idea of a subject and that it ought to be discussed through the columns of succeeding issues. Something like cleaning anodes was discussed through the columns of one of the trade journals a few years ago. At least the only disappointment of my Chicago trip was the fact that my paper brought out no discussion, as that was what I wanted, and I hope it will yet bring out something of that nature when published in the REVIEW, and I may say that a good many members of the society are of the same opinion that I am. Whenever you differ from my opinion come right straight back at me and tell me yours, as that is the only chance we of the backwoods have of getting any benefits out of the society, as we don't write articles merely to have you read them, but to get some one else to talk back and make us see where we are wrong. All I ask is to stick to facts and leave out the sarcasm.

Hoping to have my wishes satisfied in this matter, so as to get an incentive to write more, I am,

Respectfully,

H. J. TerDoest.

WHAT THE BRANCHES ARE DOING

NOTE TO THE SECRETARIES—All correspondence for this department must be in the hands of the editor by the 15th of each month.

SUPREME SOCIETY

Meets first week in June, 1915, at Dayton, Ohio. Secretary, Walter Fraine, 507 Grand Avenue, Dayton, Ohio.

NEW YORK

Meets fourth Friday of each month at 309 West 23rd Street, New York City, 8 P. M. Secretary, Joseph Minges, 148 Schenck Avenue, Brooklyn, N. Y.

The regular monthly meeting was held at the Broadway Central Hotel, Friday, June 26th. The report of the delegates to the Chicago Convention was read and enjoyed by all present.

The Annual Report of the Financial Secretary was read and shows the branch to be in a sound financial condition.

The officers for the ensuing year were installed by our worthy past-president, Chas. H. Procter.

The place of the next meeting will be at the call of the Chair.

An outing is proposed for August, when the members expect to have a good time.

MILWAUKEE

Meets second Wednesday of each month at Marquette University. Secretary, E. C. Yaeger, 962 9th St., Milwaukee, Wis.

Milwaukee Branch has elected officers as follows for the ensuing year.

President.....Daniel Wittig
Vice-President.....A. E. Koehler
Secretary.....E. C. Yaeger
Treasurer.....Ed. Wiman
Librarian.....E. C. Yaeger
Seargent-at-Arms.....Andrew Kraft
Board of Managers.....Ed. Wiman

BUFFALO

Meets first Saturday of each month at the University of Buffalo, 8 P. M. Secretary, John G. Murphy, 71 Dingens Street, Buffalo, N. Y.

President A. G. Reeve and Secretary F. C. Mesle have resigned their respective offices on account of the removal of the plant of the Oneida Community plant to Sherrell, N. Y.

Mr. John G. Murphy was elected Secretary to succeed Mr. Mesle. The election of President was deferred until the next meeting.

Following are the members of Buffalo Branch:

A. G. Reeve	I. A. Guelcher	F. C. Mesle	C. E. Seffel
Martin Seebring	J. C. Back	W. S. Nluck	C. E. Martzloff
J. G. Murphy	F. C. Nowak	J. Roesser	S. Wrobleski
Joseph Brown	Walter Becker	Arthur Wright	Chas. C. Kendrick
A. Newleck	Wm. M. Perce	Dr. A. P. Sy	
E. F. Flury	F. E. Forten	C. N. Hager	David Schuel

CHICAGO

Meets fourth Saturday of each month, 8 P. M., Western Building, Randolph Street and Michigan Avenue. Secretary, H. E. Willmore, 5911 South Boulevard, Chicago, Ill.

The regular monthly meeting was held June 27th with President O. E. Servis in the chair.

The report of the Convention Committee was read and approved. The committee was then discharged after a rising vote of thanks was given its members for their efficient work during the annual convention.

A report was made by F. J. Liscomb, Chairman of the Educational Committee. The committee was ordered continued. Mr. Liscomb spoke on the advantages that could be derived from taking formulas as published in the Brass World and Metal Industry and giving them a practical workout.

The following were appointed an Efficiency Committee to assist the Librarian: J. E. Younger, Chas. B. Wrout, George Burt.

An excellent paper was read by its author, Mr. J. E. Younger, entitled, "The Power of Knowledge."

President Servis read a humorous bit of verse which may, or may not, be good poetry, it however, created considerable amusement. Its author is Mr. E. S. Thompson. Mr. Servis also read a paper by the same author entitled, "Scientifically Cleaning Iron."

H. E. Willmore was elected to the office of Secretary, owing to the inability of Mr. J. F. Carr to serve.

DAYTON

Meets first and third Wednesday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Alphonz Lamoureux, 500 East First Street, Dayton, Ohio.

The regular monthly meeting was held Wednesday, July 1st, a which the delegates to the recent convention made their report, it being received with enthusiasm, especially the report of our President, Mr. Walter Fraine, who spoke very eloquently on the work of the convention and when he mentioned how Dayton had taken the convention away from New York the boys went wild, and from the spirit manifested there is no doubt but what the boys here will make things hum next June.

Dayton Branch started in February, 1913, with thirteen members, since which time we have taken in six active, two associate and one honorary member. Our prospects are very bright for the coming year as we have several applications in view.

Owing to the fact that three of the newly elected officers were away attending the recent convention, the officers were not installed until this meeting. They are as follows:

President.....Walter Fraine, re-elected
Vice-President.....Fletcher J. Gordon, re-elected

Secretary-Treasurer.....Alphonse Lamoureux, re-elected
Librarian.....Ohmer Stephans

Board of Managers: Chas. A. Fruend, Joseph A. Keys, Forest Hartzell.

Librarian Stephans introduced a very interesting paper on bronze solutions which will be discussed at our next meeting.

DETROIT

Meets first and third Friday of each month at Burns' Hotel. Secretary, George J. Kutzen, 518 Alfred Street, Detroit, Mich.

The regular meeting was held Friday, July 10th, with President Arthur O'Keefe in the chair. The attendance was good considering the torrid weather we were having.

President O'Keefe having entered the employ of a supply house, tendered his resignation, which was accepted. He was given a rising vote of thanks for his good work while in office. The members of Detroit Branch were sorry to see him go after electing him to the office for the third time. He retires with our best wishes for his future welfare in his new occupation.

The officers at present are:

President.....John Schultz
First Vice-President.....Harry Schutzendorf
Second Vice-President.....A. E. Whitmore
Secretary.....George J. Kutzen
Treasurer.....B. E. Miller
Librarian.....A. E. Shepherd
Sergeant-at-Arms.....Jesse Clevenger

Board of Managers, A. Vallier, A. E. Whitmore, H. S. Brockway.

In order to create a larger attendance at the meetings, the following resolutions were adopted. All dues to be paid quarterly in advance in order to be in good standing. Members suspend themselves if they allow their dues to lag over till the next quarter, and hereafter, no publications, such as the MONTHLY REVIEW, will be mailed to members residing in the City of Detroit or its suburbs. The papers to be passed out the regular meeting only, and any absent member wanting same will be obliged to pay a small sum, which will be used to help defray the postage expense of this branch. All members not residing in Detroit or its suburbs will have their literature mailed to them.

TORONTO

Meets fourth Thursday of each month at Occidental Hall, Bathurst and Queen Streets. Secretary, Ernest Coles, 15 Laurier Avenue, Toronto, Ont. Canada.

The regular monthly meeting was held June 25th with President Magill in the chair, and a good attendance of members.

The report of the convention was received from our delegate,

First Supreme Vice-President W. S. Barrows, it claiming the members' attention for a good portion of the evening. The changes in the constitution caused considerable discussion but general satisfaction was expressed.

The members of this branch have decided to pay a visit to Hamilton, Ont., Saturday, Aug. 18th. An enjoyable day's outing is anticipated.

BRIDGEPORT

Meets third Friday of each month at the office of the Brass World, 260 John Street, Bridgeport, Conn. Secretary, Nelson Barnard, 858 Howard, Ave., Bridgeport, Conn.

The regular meeting was held on Friday, June 19th, with Mr. W. G. Stratton presiding. There were twenty members out that evening.

After the general business was disposed of the branch enjoyed a very interesting talk from their representative at the annual convention, Mr. Harry de Joannis. We are very highly elated to learn that the supreme body thought so well of us to pass a resolution making us a permanent branch. We can say with full assurance that we will be found a live branch from now on.

We are going to have a talk on the rusting of steel after plating at our next meeting, July 17th, and it will prove of value to those fortunate enough to be present, as this matter is going to be handled by three of our best men in that line.

We are in fine shape for a start, as we not only have a good meeting place but also have a laboratory to work out any problem that might come up for discussion.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Penna., 34th and Spruce Streets, Philadelphia, Pa. Secretary, Philip Uhl, 2432 North Twenty-ninth Street, Philadelphia, Pa.

The regular monthly meeting was held on Friday, July 3rd, with Joseph L. Dinan presiding.

Owing to its being vacation time only the regular routine business was transacted. It was also decided to hold no meeting in August.

ROCHESTER

Meets second and fourth Wednesday of each month at University of Rochester. Secretary, Edwin S. Crowley, Jr., 868 South Goodman Street, Rochester, N. Y.

INDIANAPOLIS

Meets twice each month on Friday evenings. Secretary, pro tem, J. C. Davenport, 349 Massachusetts Avenue, Indianapolis, Ind.

ST. LOUIS

Meets fourth Saturday of each month at Public Library Assembly Rooms. Secretary, H. H. Williams, 2134 Nebraska Avenue, St. Louis, Mo.

CINCINNATI

Meets once each month at Dennison Hotel, Cincinnati, Ohio. Secretary, F. H. Normand.

NEWARK

Meets first and third Friday of each month, 8 P. M., 833 Broad Street, Newark, N. J. Secretary, Chas. A. Stiehle, 46 West Madison Avenue, Irvington, N. J.

APPLICATIONS FOR MEMBERSHIP

BRIDGEPORT—

Andrew Tucker.....628 Beechwood Ave., Bridgeport, Conn.
William Thompson.....610 Atlantic St., Bridgeport, Conn.
Alphonse N. Theiault....P. O. Box 542, South Norwalk, Conn.
Thomas F. Slattery.....74 Poplar St., Bridgeport, Conn.
John O'Neil.....136 Gem Ave., Bridgeport, Conn.
Thomas F. O'Brian.....15 Bassick Ave., Bridgeport, Conn.
Archie J. MacDermid...care J. B. Ford Co., Wyandotte, Mich.
W. G. Loeffler.....346 Lafayette St., Bridgeport, Conn.
George E. Hopkins.....1954 State, St., Bridgeport, Conn.
Chas. H. Hodissey.....460 Hollister Ave., Bridgeport, Conn.
Bernard Gastaldi.....734 Hancock Ave., Bridgeport, Conn.
Joseph A. Garde.....Kalbfleisch Acid Co., Waterbury, Conn.
David W. Flemming.....365 Harriet St., Bridgeport, Conn.
M. H. Cornstock.....226 Mt. Grove St., Bridgeport, Conn.
Edward E. Andrew.....96 Bennett St., Bridgeport, Conn.
Christian Wyrtgen.....766 Hancock Ave., Bridgeport, Conn.
P. A. Willett.....32 Liberty St., Bridgeport, Conn.

CHICAGO—

M. J. Walsh.....1920 W. Kinzie St., Chicago, Ill.
Edward Howard.....809 Prospect St., Elgin, Ill.
Fred A. Heid.....1932 Warren Ave., Chicago, Ill.
Henry Magnus.....442 N. La Salle St., Chicago, Ill.
William S. Moore.....840 W. 49th Place, Chicago, Ill.

DAYTON—

Lester J. Cope.....Collinwood & Delaware Sts., Toledo, Ohio
Leslie D. Pierce.....418 Baltimore St., Middletown, Ohio

TORONTO—

Y. Chas. Orr.....250 Dundas St., Toronto, Ont.

ELECTED TO MEMBERSHIP

DAYTON—

F. G. Cyrex.....Dayton, Ohio

DETROIT—

Albert J. Ratz.....47 Lathrop Ave., Detroit, Mich.
Alex Holmberg.....20 Crown St., Jamestown, N. Y.
John C. Smith.....600 Gratiot Ave., Saginaw, Mich.

CHICAGO—

W. C. Shaffer.....104 E. 14th St., Chicago Heights, Ill.

NEW YORK—

Herman W. Carter.....Akron, Ohio
Chas. Werft.....Cleveland, Ohio

CHANGE OF ADDRESS

S. E. Huenerfauth.....1434 Cullom Ave., Chicago, Ill.
H. C. Jaeger.....153 Cherry St., Fond du Lac, Wis.
Conrad Trantow.....926 Tappan St., Woodstock, Ill.
H. P. Robinson.....3059 Lexington St., Chicago, Ill.
A. C. Orkfritz.....266 Gertrude St., Elgin, Ill.
D. Swanson.....3137 Osgood St., Chicago, Ill.
Chas. B. Wrout.....934 Irving Park Blvd., Chicago, Ill.
H. H. Posbeck.....2231 Iowa St., Chicago, Ill.
E. S. Thompson.....1400 Lake View Road, Cleveland, Ohio
Joseph L. Dinan.....131 N. Dewey St., Philadelphia, Pa.
Edward Membrey.....22 Collahie St., Toronto, Ont.
H. T. Felgenhaur....Metal Stamping & Mfg. Co., Milwaukee, Wis.
F. C. Ohlmacher.....1510 Clybourn Ave., Chicago, Ill.

NOTICE TO BRANCH SECRETARIES

The Supreme Auditing Committee, consisting of John E. Sterling, Thomas B. Haddow and Horace H. Smith, intend sending to the Branch Secretaries a blank form of questions to be filled out by them, and the Committee requests that the Secretaries exercise the greatest care in answering the various inquiries on this form. Any incorrect or careless statement will seriously effect the accuracy of the Auditor's report.

The Committee is compelled to send out these forms as it is impossible to compile a report from the statements received from the various branches.

Branch Secretaries are requested to fill in these forms as soon as possible and return to the Committee.

These reports are for the year beginning June 1st, 1913, up to and including May 31st, 1914.